UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,058	03/07/2005	Hartmut Albrodt	R.41000	1926

2119 7590 11/16/2007

RONALD E. GREIGG
GREIGG & GREIGG P.L.L.C.
1423 POWHATAN STREET, UNIT ONE
ALEXANDRIA, VA 22314

EXAMINER	
MERKLING, MATTHEW J	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
11/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/509,058	ALBRODT ET AL.	
	Examiner	Art Unit	
	Matthew J. Merkling	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 24-26 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 24 recites the broad recitation "at least one pump", and the claim also recites "at least one pump

comprises first and second pumps" which is the narrower statement of the range/limitation.

4. Claim 33 recites the limitation "the load state" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 21, 24-29, 30, 34 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Ruoff et al. (WO 01/24294 with English language equivalent US 7,044,160).

Regarding claims 21 and 24-26, Ruoff discloses a reforming system for a fuel cell (see abstract), the system comprising

an evaporating device (4, col. 4 lines 10-11) for evaporating a raw fuel and for delivering the evaporated raw fuel to a reforming unit (10),

at least one pump for metering the raw fuel (feed pump, 21) that is conducted into the evaporating device (see flow diagram of Fig. 1 and col. 4 lines 56-65),

a control unit (24),

at least one of said at least one pumps being a metering pump whose rpm is regulated by means of the control unit (col. 2 lines 53-61 and col. 3 lines 18-23); and

at least one monitoring device (27 or 28) serving to monitor the metering quantity of the raw fuel through the at least one regulated metering pump (measuring pressure and volumetric flows and relaying information to control unit 24 which is in communication with said metering pump 21, see Fig. 2, col. 5 lines 22-30).

Regarding claim 27, Ruoff discloses the monitoring device is a pressure sensor (27), which measures the pressure in the evaporating device (outlet of the pump, col. 5 lines 22-30).

Regarding claim 28, the monitoring device monitors the current consumption of the at least one pump is an operational condition and not a structural limitation. It is noted that apparatus claims cover what a device is, not what a device does. See MPEP 2114. The manner of operating the claimed apparatus is not a patentable distinction over the prior art apparatus, therefore the claims read upon Ruoff.

Regarding claim 29, Ruoff discloses the monitoring device is a flow sensor (28), which detects the flow out of the pump into the evaporating device (col. 5 lines 22-30).

Regarding claim 30, Ruoff discloses the monitoring device is an rpm sensor, which measures the rpm of the at least one pump (col. 3 lines 18-23).

Regarding claim 34, Ruoff discloses a method for regulating the metering quantity of a metering pump in a reforming system of claim 21, wherein the metering quantity (pressure or flow rate) serves as a controlled variable, and a characteristic delivery curve of the metering pump (rpm vs. controlled variable) is stored in memory in the control unit (24), which characteristic delivery curve indicates a set-point value for the metering quantity as a function of the rpm of the metering pump (inherent, as controller makes adjustments to rpm based on controlled variable, col. 3 lines 18-23) and varies the rpm as necessary to control the controlled variable.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 22, 23, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff et al. (WO 01/24294 with English language equivalent US 7,044,160).

Regarding claims 22 and 23, Ruoff, as discussed above, does not explicitly disclose that the metering pump is an electric pump. However, it would have been obvious to one of ordinary skill to use an electric pump in said reforming

system, as electric pumps are commonly used in the art, especially for metering pump applications.

Regarding limitations recited in claims 22 and 23 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.

Regarding claims 31, Ruoff discloses the metering quantity in a fuel pump in the reforming system, as discussed in claim 21, comprising the steps of ascertaining a variable with the monitoring device (pressure or flow rate, col. 5 lines 22-30), which variable serves as a controlled variable for the regulation, and utilizing an rpm sensor to determine the rpm of the fuel pump (col. 3 lines 18-23) as a controlling variable for the regulation, the rpm being set by means of a timing module (rpm sensor is inherently a timing module, rotations per minute).

Ruoff, however, does not explicitly disclose that the metering pump is an electric pump. However, it would have been obvious to one of ordinary skill to use an electric pump in said reforming system, as electric pumps are commonly used in the art, especially for metering pump applications.

Regarding claim 32, Ruoff discloses the step of ascertaining a variable comprises measuring the pressure with a pressure sensor (27), which pressure serves as a controlled variable for the regulation (col. 3 lines 18-23 and col. 5 lines 22-23).

9. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff et al. (WO 01/24294 with English language equivalent US 7,044,160) in view of McArthur (US 6,209,309).

Regarding claim 33, Ruoff teaches utilizing an rpm sensor to determine the rpm of at least one metering pump (as discussed above) and comparing a characteristic curve (inherent by regulation of rpm with respect to outlet flow or pressure, as discussed above) to the load state (rpm) stored in memory (col. 2 lines 53-61). Ruoff, however, does not explicitly disclose the pulse width ratio of the trigger signal of the timing module serves as a controlling variable, and varying the rpm as a controlled variable by way of the pulse width ratio of the trigger signal of the timing module. McArthur teaches pulse width modulated fuel flow control to meter a fluid flow of a pump determined by timing periods that the valve is open during each cycle (col. 1 lines 10-20), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ruoff with McArthur for the purpose to provide a fuel flow control that is low cost and an efficient method of fuel control (col. 1 lines 51-55).

10. Claims 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff et al. (WO 01/24294 with English language equivalent US 7,044,160) in view of Escobar (US 5,780,729) as evidenced by Eberspach et al. (US 2002/0119408).

Regarding claims 35 and 39, Ruoff teaches a method for monitoring a metering pump (21) in a reforming system used in a motor vehicle (col. 1 lines 15-24), but does not explicitly disclose comprising outputting a warning signal by means of a drive-information system upon a deviation of a variable, ascertained by the monitoring device, from a set-point value. Escobar teaches a fuel delivery system wherein a warning signal is issued when an error occurs in the fueling system for example flow metering 8 (measured by a flow sensor) (col. 6 lines 56-59), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Ruoff to include a warning signal when error in operation of fueling system occurs for the obvious purpose to provide a warning to unsafe fueling conditions.

Regarding claim 36, the warning signal of Ruoff, as modified by Escobar, is output by the driver-information system if a monitoring device for monitoring the current consumption of the metering pump (8; Fig. 1) detects that a defined maximum or minimum current limit has been exceeded or undershot for longer than a defined length of time (col. 5 line 6 – col. 7 line 4).

Regarding claim 37, Ruoff in view of Escobar teach all of the limitations as applied to claim 35 above but is silent to wherein the a warning signal is output by a driver-information system if the rpm of the metering pump, measured by the rpm sensor, deviates from the set-point value. However such modification would

merely be utilizing a value determining arrangement to sense the operating state based on rpm of pump as opposed to flow and would have been an obvious control variable modification to one of ordinary skill in the art at the time of the invention (See Eberspach et al., US Pub. 2002/0119408 at [0010]).

Regarding claim 38, Ruoff teaches all of the limitations as applied to claim 34, but does not explicitly teach outputting a warning signal by a driver-information system if the metering quantity measured by a flow sensor deviates from its set-point value. Escobar teaches a fuel delivery system wherein a warning signal is issued when an error occurs in the fueling system for example flow metering 8 (measured by a flow sensor) (col. 6 lines 56-59), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Ruoff to include a warning signal when error in operation of fueling system occurs for the obvious purpose to provide a warning to unsafe fueling conditions.

Response to Arguments

11. Applicant's arguments, filed 4/4/07 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ruoff et al. (WO 01/24294).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Merkling whose telephone number is (571) 272-9813. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MM

MJM

Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700